

forming a third insulating film on said second insulating film, said third insulating film being made of a material different from that of the second insulating film and having a thickness larger than that of the second insulating film;

forming a groove in a region of said third insulating film, in which a wiring is to be formed, said groove having a bottom to which said second insulating film is exposed;

removing a part of that portion of the second insulating film which is exposed to the groove, and a part of the first insulating film under the portion of the second insulating film, using the same etching mask, and thus forming a contact hole reaching to the semiconductor substrate; and

burying the groove and the contact hole with copper to form a copper wiring in said groove and a copper contact in said contact hole, and controlling said burying with said copper to avoid formation of a native oxide.

40. (Amended) A process of fabricating a semiconductor device comprising the steps

of:

forming a first insulating film on a semiconductor substrate;

forming a second insulating film on said first insulating film, said second insulating film being made of a material different from that of the first insulating film and having a thickness smaller than that of the first insulating film;

forming a third insulating film on said second insulating film, said third insulating film being made of a material different from that of the second insulating film and having a thickness larger than that of the second insulating film;

forming a groove in said third insulating film having a bottom comprising said second insulating film; and

forming copper in said groove, wherein forming said copper is controlled to avoid formation of a native oxide;

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wherein said step of forming said groove comprises;
etching through said second insulation film to expose said first insulation film while
leaving a remaining second portion of said second insulation film;
removing a third portion of said first insulation film to expose said substrate while
leaving a remaining fourth portion of said first insulation film.

REMARKS

Favorable reconsideration of this application is respectfully requested.

Claims 29-33 and 35-40 are now pending in this application, claim 34 being canceled by way of the present amendment. Under 35 U.S.C. §103(a), claims 29-39 stand rejected over U.S. 4,789,648 (Chow et al.) in view of U.S. 5,612,254 (Mu et al.) and U.S. 5,272,117 (Roth et al.) and claim 40 stands rejected over Chow et al. in view of U.S. 4,832,789 (Cochran et al.).

First, the applicants greatly appreciate the interview with Examiner Maldonado where the differences between the claimed invention and the prior art was discussed in detail. In particular, the disclosure of Chow et al. lacking any suggestion of etching the claimed first and second films using the same mask as recited in claim 29 was discussed, along with the lack of any suggestion in Chow et al. or the other references to combine Chow et al. with the other references. However, no agreement was reached. Examiner Maldonado asked the applicants to provide detailed arguments and he would reconsider his position after reviewing such arguments.

Also, at the interview Examiner Maldonado pointed to three features he found distinguish over the prior art of record. One was found on line 4, page 52 where the deposition of a copper film is controlled to avoid the formation of a native oxide. Claim 29 has been amended to recite burying copper in a groove and claim 40 recites forming copper